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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/192,674

11/16/1998

DANIELE BAGNI

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07/28/2006

PHILIPS INTELLECTUAL PROPERTY & STANDARDS

P.O. BOX 3001

BRIARCLIFF MANOR, NY 10510

EXAMINER

CHEN, WENPENG

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 07/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/192,674

Applicant(s)

BAGNI ET AL.

Examiner

Wenpeng Chen

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Examiner's responses to Applicant's remark

1. Applicants' arguments filed on 2/27/2006 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference to reasonably and properly meet the claimed limitation.

a. Applicants' argument -- Neither Ng nor de Haan teaches “estimating (ME) first motion vectors (MV c, MV l, MV r, MV a, MV b) *associated with a set of first objects of a fixed size, said motion vectors MV l, MV r, MV a, MV b being associated with first objects adjacent to the first object* associated with the MV c motion.”

Examiner's response -- Ng clearly teaches the feature at least in Fig. 6 and column 5, lines 39-64. The objects are the macroblocks of 16 x 16 size. The series of pictures associated with the odd field is itself a series of “frames” to be coded with the MPEG protocol. During the motion compensation process, motion vectors of all the macroblocks are derived. For a given macroblock, it has a motion vector MV c. Also each of its adjacent macroblocks has its own motion vector, one of MV l, MV r, MV a, MV b. So all of the motion vectors associated with all the macroblocks of 16 x 16 size are estimated.

b. Applicants' argument -- Neither Ng nor de Haan teaches “filtering (MVPF) every occurrence of the first motion vectors (MVc, MVl, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects having a fixed size smaller than the first

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objects fixed size.” De Haan teaches that the generation of motion vectors for the four sub-blocks is based on the motion vector associated with the macro-block enclosing the four sub-blocks.

Examiner's response -- The Examiner considers the second statement with regard to de Hann's teaching is not relevant to the recited “filtering” step. Using MV c, the motion vector of the center macroblock is not in any conflict with the above-cited limitation. De Haan teaches that the generation of motion vectors for the four sub-blocks is based on (1) the motion vector associated with the macro-block H enclosing the four sub-blocks and (2) the motion vectors of its adjacent macroblocks E and G as evidently shown in Fig. 7 for $H_{1,1}$ sub-block. Equations 29-35 clearly teach how macroblocks D-L are used to generate motion vector of the 4 sub-blocks in the H macroblock with median filtering process. Please also see the previous Examiner's Answer (paper #24.)

c. Applicants' argument -- De Hann fails to provide any motivation to perform a filtering step using information from adjacent blocks.

Examiner's response -- The motivation has been clearly provided in the previous Examiner's Answer (paper #24) for which the board affirmed the Examiner's position and in the Office Action (paper #20051125) mailed on 11/29/2005. The Examiner's argument provided in the Answer is copied below.

First, de Haan points out that limiting to one vector per block of pixels introduces visible block structures with very visible artifacts (from the last two line, left column to line 3, right column, page 373.) This is a problem needed to be fixed.

Second, de Haan points out that the post filter in reference 15 can solve the problem. However, it introduces a drawback of blurring the discontinuities in the vector field (lines 3-6, right column, page 373.) A person skilled in the art understands that the discontinuities in the vector field are associated with contours. Blurring the discontinuities thus blurs the contours that are desired to be preserved for reproducing lines or sharp edges of objects in images.

Then, de Haan teaches a post-operation to solve the above problem without the above drawback.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ng (US patent 5,146,325 cited previously) in view of de Haan et al. ("True-Motion Estimation with 3-D Recursive Search Block Matching," de Haan, G et al., IEEE Trans. On Circuits and Systems for Video Technology, vol. 3, No. 5, October 1993, pages 368-379 cited previously.)

Ng teaches a device and method for coding and decoding comprising the following means and corresponding steps for:

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-- estimating (ME) first motion vectors (MV c, MV l, MV r, MV a, MV b) *associated with a set* of first objects of a fixed size of (16*16) pixels, said motion vectors MV l, MV r, MV a, MV b being associated with first objects adjacent to the first object associated with the MV c motion vector; (Fig. 6; column 5, lines 39-64; The objects are the macroblocks of 16 x 16 size. The series of pictures associated with the odd field is itself a series of “frames” to be coded with the MPEG protocol. During motion compensation process, motion vectors of all the macroblocks are derived. For a given macroblock, it has a motion vector. Also each of its adjacent macroblocks has its own motion vector.)

-- generating prediction errors in dependent on the motion vectors associated with the second objects of size (8*8) pixels, being smaller than the first objects; (column 5, lines 39-64; The blocks are the second objects having 8 x 8 size. The residues are the prediction errors.)

-- combining (VLC) the first motion vectors and the prediction errors; (column 7, lines 44-61)

-- generating (VCL⁻¹) first motion vectors (MV c, MV l, MV r, MV a, MV b) and prediction errors from input stream, the first motion vectors (MV c, MV l, MV r, MV a, MV b) relating to the first objects of a fixed size, and said motion vectors MV l, MV r, MV a, MV b being associated with first objects adjacent to the first object associated with the MV c motion vector; (elements 306 and 308 of Fig.5; column 10, line 62 to column 11, line 23)

-- generating an output signal in dependence on the prediction errors and the motion vectors associated with the second objects having a fixed size smaller than said first objects fixed size; (column 10, lines 31-61;)

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-- means for receiving a motion-compensated, predictively-encoded image signal;
(column 10, line 58 to column 11, line 12, The signal inputted to VLD 308 is the signal.)

-- means for displaying the decoded image signal. (column 9, lines 33-57)

However, Ng does not teach (1) the filtering steps (MVPF) and (2) using the second motion vectors only for generating prediction errors.

The de Haan paper teaches filtering steps comprising:

-- filtering (MVPF) every occurrence of the first motion vectors (MVc, MVl, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects, the second objects being smaller than the first objects (1/4 of the first object); (section VII in pages 373-374)

- providing x and y motion vector components of a given macroblock (MVc) and of macroblocks (MVl, MVr, MVa, MVb) adjacent to the given macroblock (MVc); (section VII in pages 373-374; Eq. (33))

- supplying for each block (MV1) of a number of blocks (MV 1, MV 2, MV 3, MV 4) corresponding to the given macroblock (MVc), x and y motion vector components respectively selected from the x and y motion vector components of the given macroblock (MVc) and from the x and y motion vector components of two blocks (MVl, MVa) adjacent to the block (MV1). (section VII in pages 373-374; Eq. (33); Fig. 7)

-- using only the obtained second motion vectors (MV1, MV2, MV3, MV4) of the second objects for motion compensation to reduce visible block structures. (first paragraph in section VII)

It is desirable to reduce visible block structures in coding and decoding an image signal.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to add

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de Haan's filtering processes for motion vectors in Ng's method and system, in which the second motion vectors are obtained from the first motion vectors, because the combination provides a better quality of decoded images by reducing blockness. The combination thus teaches:

- obtaining second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8), from the first motion vectors (MVc, MVl, MVr, MVa, MVb) and
- the prediction errors depend on the second motion vectors.

Because the Ng's decoding process is a reverse process of its own coding process, it would be obvious to one of ordinary skill in the art, at the time of the invention, in the decoding process to add the following feature already discussed above to implement the decoding process:

- filtering every occurrence of the first motion vectors (MV c, MV l, MV r, MV a, MV b) using a set of motion vectors including the first motion vectors to obtain second motion vectors (MV 1, MV 2, MV 3, MV 4) for second objects, the second objects being smaller than the first objects.

Because the filtering process is for the purpose for reducing visible block structures with block erosion, the filtering is applied to every occurrence of the first motion vectors and only the filtered motion vectors of the smaller blocks are used for motion compensation.

Conclusion

2. THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). The Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 571-272-7431. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 571-273-8300 for After Final communications. TC 2600's customer service number is 571-272-2600.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

July 21, 2006

Conclusion

4. THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). The Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

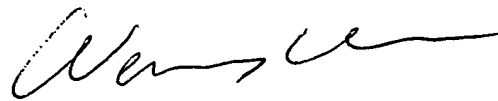
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A handwritten signature in black ink, appearing to read 'Wenpeng Chen', written in a cursive style.

Wenpeng Chen
Primary Examiner
Art Unit 2624

July 21, 2006